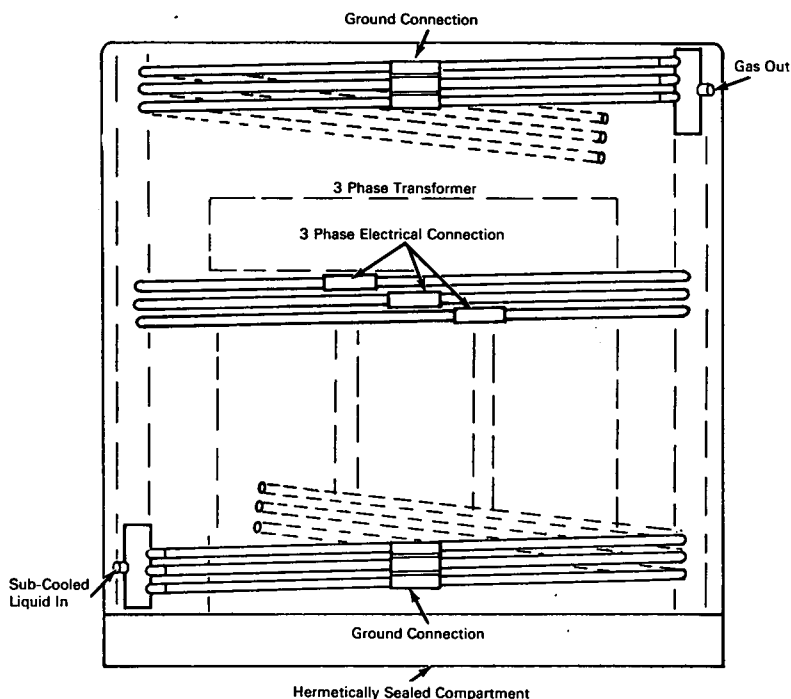


NASA TECH BRIEF



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Complementary System Vaporizes Subcooled Liquid, Improves Transformer Efficiency



The problem:

Certain test facilities require large quantities of gaseous hydrogen or nitrogen in their operation. These gases are normally stored in their subcooled liquid state and it is necessary to apply heat to convert them to the large gaseous volumes required. It is desirable to achieve this conversion as economically as feasible, preferably without conventional heat transfer media.

The solution:

A complementary system that takes advantage of the inherent induction heat losses of an electrical transformer to convert the liquid to a gas. Transformer efficiency is improved in the process.

How it's done:

A parallel arrangement of three heat exchanger tubes is placed within the transformer enclosure in

(continued overleaf)

close proximity to the transformer core. The subcooled liquid to be vaporized is passed through the parallel paths of tubing from an inlet header to an outlet header where it emerges as gas vapor. Each tube is connected as a single phase load on the three phase transformer output. The compartment containing the tubing and transformer core is hermetically sealed to prevent moisture buildup on the tubing.

Notes:

1. Transformer efficiency is greatly increased and a given load may be handled with a much smaller core.

2. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama, 35812
Reference: B66-10045

Patent status:

No patent action is contemplated by NASA.

Source: Edward C. Ketaily
of North American Aviation, Inc.
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Marshall Space Flight Center
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